

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-20 (Canceled).

Claim 21 (New): A cold cathode discharge device used as a discharge lamp, comprising:  
an envelope filled with a discharge gas therein;  
a cold cathode comprising a supporting member of conductive material and an electron emitter with an electron-emitting surface configured to emit electrons and supported by the supporting member, the electron emitter being positioned in the envelope; and  
the discharge gas comprises a rare gas and mercury,  
wherein the electron emitter comprises a mixed phase of diamond phase and conductive carbon phase, the diamond phase comprises granular bodies, and the conductive carbon phase is formed between the granular bodies.

Claim 22 (New): The cold cathode discharge device as stated in Claim 21, wherein the discharge gas comprises xenon.

Claim 23 (New): The cold cathode discharge device as stated in Claim 21, wherein the diamond phase of the electron emitter comprises a donor impurity.

Claim 24 (New): The cold cathode discharge device as stated in Claim 21, wherein the conductive carbon phase comprises graphite or amorphous carbon layers.

Claim 25 (New): The cold cathode discharge device as stated in Claim 21, wherein the electron-emitter surface is made rough, and the conductive carbon phase is exposed on the electron emitting surface.

Claim 26 (New): The cold cathode discharge device as stated in Claim 21, wherein the envelope is an elongated envelope having the supporting member in both end regions thereof.

Claim 27 (New): The cold cathode discharge device as stated in Claim 21, wherein the conductive carbon phase extends in the form of a channel between the supporting member and the electron-emitting surface in the electron emitter.

Claim 28 (New): A cold cathode discharge device used as a discharge lamp, comprising:

an envelope filled with a discharge gas therein;  
a cold cathode comprising a supporting member of conductive material and an electron emitter with an electron-emitting surface configured to emit electrons and supported by the supporting member, the electron emitter being positioned in the envelope; and  
the discharge gas comprises a gas including an element with a principal radiation peak of 200 nanometers or less in wavelength,

wherein the electron emitter comprises a mixed phase of diamond phase and conductive carbon phase, the diamond phase comprises granular bodies, and the conductive carbon phase is formed between the granular bodies.

Claim 29 (New): The cold cathode discharge device as stated in Claim 28, wherein the discharge gas comprises xenon.

Claim 30 (New): The cold cathode discharge device as stated in Claim 28, wherein the diamond phase of the electron emitter comprises a donor impurity.

Claim 31 (New): The cold cathode discharge device as stated in Claim 28, wherein the conductive carbon phase comprises graphite or amorphous carbon layers.

Claim 32 (New): The cold cathode discharge device as stated in Claim 28, wherein the electron-emitting surface is made rough, and the conductive carbon phase is exposed on the electron emitting surface.

Claim 33 (New): The cold cathode discharge device as stated in Claim 28, wherein the envelope is an elongated envelope having the supporting member in both end regions thereof.

Claim 34 (New): The cold cathode discharge device as stated in Claim 28, wherein the conductive carbon phase extends in the form of a channel between the supporting member and the electron-emitting surface in the electron emitter.